To: Tina Laidlaw/MO/R8/USEPA/US@EPA[]
From: "Blend, Jeff"
Sent: Wed 8/24/2011 1:35:15 PM
Subject: RE: secondary scores table
S_W Demonstrationw_TinaJeff_August21_2011.xlsx

Here it is. Still working on it. The last two tabs are also interesting.

Jeff Blend
(406) 841-5233
jblend@mt.gov

Economist and Energy Analyst
Energy and Pollution Prevention Bureau
Montana Dept. of Environmental Quality
1100 N. Last Chance Gulch
P.O. Box 200901
Helena, MT 59620-0901

-----Original Message-----
From: Laidlaw.Tina@epamail.epa.gov [mailto:Laidlaw.Tina@epamail.epa.gov]
Sent: Tuesday, August 23, 2011 2:48 PM
To: Blend, Jeff
Subject: RE: secondary scores table

didn't you say you had done some clean-up on the S&W table? I thought I should use that version.

Tina

Tina Laidlaw
USEPA Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626
406-457-5016

From: "Blend, Jeff" <jblend@mt.gov>
To: Tina Laidlaw/MO/R8/USEPA/US@EPA
Date: 08/23/2011 07:52 AM
Subject: RE: secondary scores table

Here they are. Also attached is the latest spreadsheet based on what you gave me last week.

Jeff Blend
(406) 841-5233
jblend@mt.gov

Economist and Energy Analyst
Energy and Pollution Prevention Bureau
Montana Dept. of Environmental Quality
1100 N. Last Chance Gulch
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-----Original Message-----
From: Laidlaw.Tina@epamail.epa.gov [mailto:Laidlaw.Tina@epamail.epa.gov]

Sent: Monday, August 22, 2011 4:22 PM
To: Blend, Jeff
Subject: secondary scores table

Jeff,

Would you mind emailing me a copy of the secondary scores for the MT towns? Thanks!

Tina

Tina Laidlaw
USEPA Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626
406-457-5016

[attachment "Secondary score case studies_2011.xls" deleted by Tina Laidlaw/MO/R8/USEPA/US] [attachment "S_W Demonstrationw_TinaJeff_August21_2011.xlsx" deleted by Tina Laidlaw/MO/R8/USEPA/US]

Community	Current Treatment Technology	Would the criteria apply? Or is there dilution capability?	Design Flow (MGD)	Actual Flow (MGD)	Community Population (Census 2010)	Number of Households (American Community Survey 2005-2009)
Big 7 Communities						
Kalispell	BNR (modified Johannesburg); 3.1 to 5.4 MGD; avg. .12 mg/l TP; 10 mg/l TN.	Yes. EOP; Ashley Creek	5.4	3.10	27,544	10,012
Bozeman	some BNR now; 5-stage Barrdenpho; new plant will be BNR (1 mg/l TP; 3 mg/l TN starting in 2011); current 5.8 MGD; increasing to 13.9 mgd	Yes. Also Gallatin TMDL in the works.	13.8	5.80	37,280	14,614
Helena	BNR; 3 mg/l TP; 10 mg/l TN; design capacity of 5.4; current discharge ~3.0 MGD	Yes. WLA set in TMDL based on numeric criteria.	5.4	3.00	28,190	12,337
Butte	Current technology is activated sludge (TN of 18.5 mg/l; TP of 2.11 mg/l); under Order to Construct to membrane BNR; current design is 8.5 MGD; talking about lowering to 6.1 MGD. Sewer Fee based on DEQ estimtes. Included in current fee is $27 million upgrade in new capital costs and $1.125 million in O&M costs which would bring them to 5 TN and 0.1 TP	Yes. EOP.	8.5	4.00	33,525	14,041
Billings	2ndary treatment; Design flow of 26 MGD (avg.) and 40 MGD max.	Yes. Discharge into the Yellowstone River.	26	26	104,170	41,841
Missoula	advanced secondary treatment facility with biological nutrient removal and ultraviolet disinfection; meets Clark Fork criteria w/ mixing zone. 8.2 mg/l TN; 0.16 -0.4 mg/l TP; get a mixing zone, meeting criteria currently. BNR. Design flow = 12 MGD ; actual flow = 9 MGD. (designed for 10 and 1). (HDR)	Yes. With mixing zone. Currently meeting criteria after mixing zone.	12	9	66,788	27,553

Great Falls	conventional 2ndary activated sludge (max 21-MGD; avg. 10 MGD)	Yes. Missouri River	26	26	58,505	23,998
Other Large Communities > 1 MGD						
Livingston	discharges into the Yellowstone; permit renewed in 2010; mechanical plant w/ 2 primary clarifiers, 3 rotating biological contactors, UV, installing co-composting. DMR shows 11 mg/l TN average (20 mg/l for May) and 2 mg/l TP (3 mg/l for May).	Yes. Discharge into the Yellowstone River.	5	2	7,414	2,966
Miles City	2ndary treatment plus oxidation ditch. 2011 permit. Algae plant study to remove nutrients. Extended aeration system w/2 oxidation ditches w/rotating brush aerators; 2 clarifiers and chlorine basin. TN avg of 23.5 mg/l; TP avg. 3.6 mg/l.	Yes. Discharge into the Yellowstone River.	3.7	2	9,500	3,800
Hamilton	BNR facilitry. t w/ extended aeration system. Oxidation ditch w/ rorating brush aerators. 3 clarifiers. Upgraded in 2010. TN avg. 5.5 mg/l; TP avg. 5 mg/l.	Yes	1.98	0.68	5,200	2,080
Lewistown	BNR plant. Focus on TP removal. 0.8 mg/l TP; 3-4 mg/l TN.	Yes	2.5	1.5	5,813	2,325
Havre	Discharges into the Milk River. Permit renewed in 2011. Activated sludge facility with effluent chlorination. 2006-2010 data showed avg. TP of 3.4 (TN not required). 2011 DMR showed TN of 19.4 mgl; Tp of 1.3 mg/l.	Yes	4.4	2.8	10,325	4,130
Non-Lagoon Facilities with < 1MGD						
Columbia Falls	Newer plant. Designed to achieve 8 mg/l TN	Yes	0.766	0.37	4,688	1,621

Manhattan	Discharges into Diva Ditch. Permit renewed in 2010. Denitrification with fixed film suspended growth system, clarifiers and aerobic sludge digestion, UV. DMR data from winter quarter shows 11 mg/l TN and 1 mg/l TP. 2008-2010 showed avg. TN of 14 mg/l TN and 4 mg/l TP.	Yes	0.6	0.4	1,400	560
Lagoons						
Philipsburg	lagoon to simple mechanical system - ref: Gary Swanson, consulting engineer- 15TN, 2TP	Yes.	0.2	0.2	820	399
Cut Bank	Lagoon.	Yes	0.643	0.643	2,869	1,290
Deer Lodge	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork	Yes	3.3		3,111	1,522
Glendive	domestic WW lagoon; 3 cell facultative; current O&M costs are <$; 8-10 capital costs for new plant. O&M increase of ~$300,000. new avg. 1.15 MGD; PER completed to upgrade to mechanical SBR or BNR plant.	Yes	1.3	N/A	4935	1883
Redlodge	Lagoon.	Yes	1.2	0.65	2125	1055
Big Fork	Lagoon.	Yes	0.5		4270	1708
Highwood	Lagoon.	Yes	0.026	0.015	176	53
Circle	Lagoon.	Yes	0.16	0.065	615	234

NOTE: Operation costs include energy and chemical costs only and do not include labor and maintenance cost. As such, these numbers are on the low side.

NOTE: The numbers are intended to provide ROUGH ESTIMATES for discussion purposes and do not reflect the site-specific conditions at each plant.

NOTE: Capital costs were assumed to cover a 20-year bond with 5% interest (used 0.0802 conversion factor)

NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.

	Indicates rough estimates; need to verify		
	Big Fork number of household based on population divided by 2.5		

Median Household Income (2010) - American Community Survey.	Current average household sewer bill per year (2008 / 2011)	Current average sewer fee as % of MHI	Notes	Capital cost (million dollars) to meet the numeric nutrient criteria (WERF)	Annual Capital cost to meet the numeric nutrient criteria (L4 WERF)	Annual Operations costs to meet the numeric nutrient criteria L4WERF	Annual Capital and Operations cost ($)
Big 7 Communities							
$39,953.00	$216.00	0.54%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2.	49.14	$3,941,028	$1,228,530	$5,169,558
$41,661.00	$372.00	0.89%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2. Really Level 3 for TN and 1 for TP	125.58	$10,071,516	$2,298,540	$12,370,056
$47,152.00	$265.44	0.56%	Sewer rates obtained from City in 2011. Plant ~ WERF Level 1.	67.50	$5,413,500	$1,298,400	$6,711,900
$37,335.00	$360.00	0.96%	Sewer Fee based on DEQ estimtes. While current monthly fee is $13.50, the $27 million upgrade in new capital costs plus $1.125 million in additional O&M costs which would bring them to 5 TN and 0.1 TP (WERF 3) would raise rates to $30 per month	62.90	$5,044,580	$1,161,800	$6,206,380
$45,004.00	$218.28	0.49%	The numbers for Billings and Great Falls (treatment levels, treatment costs etc.) were obtained from HDR.	312.50	$25,062,500	$11,252,800	$36,315,300
$34,319.00	$152.14	0.44%	Sewer rates obtained from city. 2011 values.	88.80	$7,121,760	$2,614,050	$9,735,810

$40,718.00	$187.20	0.46%	At WERF 1. The numbers for Billings and Great Falls (population, treatment levels, etc.) were obtained from HDR.	312.50	$25,062,500	$11,252,800	$36,315,300
Other Large Communities > 1 MGD							
$35,689.00	$600.00	1.68%	Assume WERF Tier 1	62.50	$5,012,500	$865,600	$5,878,100
$37,554.00	$236.10	0.63%	Assume WERF Tier 1	46.25	$3,709,250	$865,600	$4,574,850
$25,161.00	$276.00	1.10%	Assume WERF 2 (since TN gets to WERF 3 and TP WERF 1)	24.75	$1,984,950	$301,984	$2,286,934
$31,729.00	$387.60	1.22%	Assume WERF 3 based on current treatment levels	18.50	$1,483,700	$423,675	$1,907,375
$43,577	$240.00	0.55%	Assumed WERF Level 1.	$55.00	$4,411,000	$1,211,840	$5,622,840
Non-Lagoon Facilities with < 1MGD							
$38,750	$532.20	1.37%	Upgrade to RO	$5.67	$454,606	$580,900	$1,035,506

$50,729	$362.40	0.71%	Assumed WERF Level 2. Correct? Paul.	$5.46	$437,892	$63,408	$501,300
Lagoons							
$31,375.00	$200.00	0.64%	Assume WERF 1	$12.50	$ 1,002,500.00	382,800.00	$1,385,300.00
$44,833	$138.48	0.31%	4000 gallons. Base rate $9.48 at 3000 gallons plus $2.06 for next 1,000 gallons	$14.02	$ 1,124,195.48	228,290.40	$1,352,485.88
$40,320	$409.56	1.02%	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork	$71.94	$1,261,145.00	$0.00	$1,261,145.00
$42,821	$213.96	0.50%		$28.34	$2,272,868.00	$0.00	$2,272,868.00
$50,123	305.28	0.61%	Sewer Fee and MHI based on DEQ estimates. DEQ MHI value less than the 2010 USDA county data.	$26.16	$2,098,032.00	$308,132.50	$2,406,164.50
$44,398	580.36	1.31%		$10.90	$874,180.00	$0.00	$874,180.00
$62,614	600.00	0.96%		$0.57	$45,457.36	$7,110.75	$52,568.11
$29,000	259.56	0.90%		$3.49	$279,737.60	$30,813.25	$310,550.85

e.

Annual Additional Cost per Household (increase in sewer rate)	Predicted average household sewer fee to meet criteria	Expected % MHI to Meet Base Numeric Nutrient Criteria (plus current wastewater fees)	Percent increase in Wastewater bill		
$516	$732	**1.83**	239%		
$846	$1,218	**2.92**	228%		
$544	$809	**1.72**	205%		
$442	$802	**2.15**	123%		
$868	$1,086	**2.41**	398%		
$353	$505	**1.47**	232%		

$1,513	$1,700	**4.18**	808%		
$1,982	$2,582	**7.23**	330%		
$1,204	$1,440	**3.83**	510%		
$1,099	$1,375	**5.47**	398%		
$820	$1,208	**3.81**	212%		
$1,361	$1,601	**3.68**	567%		
$639	$1,171	**3.02**	120%		

$895	$1,258	**2.48**	247%		
$3,471.93	$3,672	**11.70**	1736%		
$1,048.44	$1,187	**2.65**	757%		
$828.61	$1,238	**3.07**	202%		
$1,207.05	$1,421	**3.32**	564%		
$2,280.72	$2,586	**5.16**	747%		
$511.81	$1,092	**2.46**	88%		
$991.85	$1,592	**2.54**	165%		
$1,327.14	$1,587	**5.47**	511%		

WERF

Level	Description	Capital Cost ($/gpd)	Operations ($1/ MG/day Treated)
Level 1	No N and P removal	9.3	250
Level 2	1 mg/l TP; 8 mg/l TN	12.7	350
Level 3	0.1-0.3 mg/l TP; 4-8 mg/l TN	14.4	640
Level 4	<0.1 mg/l TP; 3 mg/l TN	15.3	880
Level 5	<0.01 mg/l TP; 1 mg/l TN	21.8	1370

Tina--- check report. Do you need assume 0 as existing capital costs.

had to pick a level; could be estim

Costs to Meet Criteria	Capital Cost($million/MGD)	Design Flow	Facility Upgrade Capital Costs ($million)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)
Kalispell	9.1	5.4	$49.14	$3.94
Bozeman	9.1	13.8	$125.58	$10.07
Helena	12.5	5.4	$67.50	$5.41
Butte	7.4	8.5	$62.90	$5.04
Billings	12.5	25	$312.50	$25.06
Missoula	7.4	12	$88.80	7.12176
Great Falls	12.5	25	$312.50	25.0625
Livingston	12.5	5	$62.50	$5.01
Miles City	12.5	3.7	$46.25	$3.71
Hamilton	12.5	1.98	$24.75	1.98495
Lewistown	7.4	2.5	$18.50	1.4837
Havre	12.5	4.4	$55.00	4.411
Columbia Falls	7.4	0.766	$5.67	0.45461
Manhattan	9.1	0.6	$5.46	0.43789
Philipsburg	12.5	1	$12.50	$1.00
Cut Bank	21.8	0.643	$14.02	$1.12
Deer Lodge	21.8	3.3	$71.94	$5.77
Glendive	21.8	1.3	$28.34	2.27287
Red Lodge	21.8	1.2	$26.16	2.09803
Big Fork	21.8	0.5	$10.90	0.87418
Highwood	21.8	0.026	$0.57	0.04546
Circle	21.8	0.16	$3.49	0.27974

to divide by 10? Or are the numbers in MG?

ated on the less expensive side..?

Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Operations ($1/ MG/day Treated)	Operations Costs ($/ year/ 1 MGD)	Actual Flow	Facility Upgrade Operations Costs (annual) based on Facility MGD	Membrane Replacement Cost ($24,000 /yr/1 MGD)*Actual Flow
$3,941,028.00	1020	372,300.00	3.10	1,154,130.00	74,400.00
$10,071,516.00	1020	372,300.00	5.80	2,159,340.00	139,200.00
$5,413,500.00	1120	408,800.00	3.00	1,226,400.00	72,000.00
$5,044,580.00	730	266,450.00	4.00	1,065,800.00	96,000.00
$25,062,500.00	1120	408,800.00	26.00	10,628,800.00	624,000.00
$7,121,760.00	730	266,450.00	9.00	2,398,050.00	216,000.00
$25,062,500.00	1120	408,800.00	26	10,628,800.00	624,000.00
$5,012,500.00	1120	408,800.00	2.00	817,600.00	48,000.00
$3,709,250.00	1120	408,800.00	2.00	817,600.00	48,000.00
$1,984,950.00	1120	408,800.00	0.68	277,984.00	24,000.00
$1,483,700.00	730	266,450.00	1.50	399,675.00	24,000.00
$4,411,000.00	1120	408,800.00	2.80	1,144,640.00	67,200.00
$454,605.68	730	266,450.00	2.00	532,900.00	48,000.00
$437,892.00	1020	372,300.00	0.16	59,568.00	3,840.00
$1,002,500.00	1120	408,800.00	1.00	408,800.00	24,000.00
$1,124,195.48	1120	408,800.00	0.64	262,858.40	15,432.00
$5,769,588.00	1370	500,050.00		0.00	0.00
$2,272,868.00	1370	450,050.00		0.00	0.00
$2,098,032.00	1370	450,050.00	0.65	292,532.50	15,600.00
$874,180.00	1370	450,050.00		0.00	0.00
$45,457.36	1370	450,050.00	0.015	6,750.75	360.00
$279,737.60	1370	450,050.00	0.065	29,253.25	1,560.00

Total Operations costs including membrane replacement
1,228,530.00
2,298,540.00
1,298,400.00
1,161,800.00
11,252,800.00
2,614,050.00
$11,252,800.00
$865,600.00
$865,600.00
301,984.00
423,675.00
$1,211,840.00
$580,900.00
$63,408.00
$432,800.00
$278,290.40
$0.00
$0.00
$308,132.50
$0.00
$7,110.75
$30,813.25

Community	Current Treatment Technology
> 1 MGD	
Kalispell	Already below variance levels; achieving avg. 0.12 mg/l TP and 10 mg/l TN. Town expected to pay an addition $6,967,150.56 annually to achieve 2% MHI.
Bozeman	Already below variance levels; should be close to achieving 1 mg/l TP and 3 -5 mg/l TN starting in 2011/2-12. Town expected to pay an additional $8,319,750.2 annually to achieve 2% MHI.
Helena	After optimization study, should be achieving variance levels. Currently at 3 mg/l TP and 10 mg/l TN. Town expected to pay an additional $9,633,963.3 annually to achieve 2%MHI.
Butte	Under Order to Construct to membrane BNR Will already meet variance levels after upgrade. The $27 million upgrade in new capital costs plus $1.125 million in additional O&M costs which would bring them to 5 TN and 0.1 TP. Upgrade would result in 1.5% MHI. Additional costs needed?
Missoula	Already meets Clark Fork criteria w/ mixing zone. Achieiving 8.2 mg/l TN; 0.16 -0.4 mg/l TP. Would the town be expected to pay more (~$18 million annually) towards 2% MHI or not since they are achieving the criteria?
Great Falls	Conventional 2ndary activated sludge (max 21-MGD; avg. 10 MGD). Based on Billings case study, likely long-term variance limits of Level 4 for WERF (0-.1 mg/l TP; 3 mg/l TN)
Billings	2ndary treatment; Design flow of 26 MGD (avg.) and 40 MGD max. Based on Billings case study, likely long-term variance limits of Level 4 for WERF (0-.1 mg/l TP; 3 mg/l TN)

Livingston	Based on existing high costs, likely that meeting 1 mg/l and 10 TN would be the feasible limits. MHI of 3.05 percent to achieve WERF level 3.
Miles City	2011 permit; calculated variance limits to <0.1 mg/l TP; 3 mg/l TN
Hamilton	BNR facilitry. t w/ extended aeration system. Oxidation ditch w/ rorating brush aerators. 3 clarifiers. Upgraded in 2010.
Lewistown	Already below variance levels;BNR plant. Lready below proposed interim effluent limits (0.8 mg/l TP; 3-4 mg/l TN).
Facilities with < 1MGD	
Manhattan	Discharges into Diva Ditch. Permit renewed in 2010. Denitrification with fixed film suspended growth system, clarifiers and aerobic sludge digestion, UV. DMR data from winter quarter shows 11 mg/l TN and 1 mg/l TP. 2008-2010 showed avg. TN of 14 mg/l TN and 4 mg/l TP.
Columbia Falls	Columbia Falls already meets variance level standards. Actual cost of $3,927,688
Havre	Discharges into the Milk River. Permit renewed in 2011. Activated sludge facility with effluent chlorination. 2006-2010 data showed avg. TP of 3.4 (TN not required). 2011 DMR showed TN of 19.4 mgl; Tp of 1.3 mg/l.
Lagoons	
Philipsburg	lagoon to simple mechanical system - ref: Gary Swanson, consulting engineer- 15TN, 2TP; Do we have actual costs for the upgrade?
Cut Bank	

Deer Lodge	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork
Glendive	Upgrade from a lagoon to mechanical plant - BNR or otherwise would result in > 2%MHI
Redlodge	Upgrade from a lagoon to mechanical plant - BNR or otherwise would result in >1.5% MHI

2% MHI information
draft numbers pending input

Flow Category	Community Population	Number of Households (Population / 2.5) based on 2000 Census	Median Household Income (2010) - countywide MHI. Recommend updating for service area.	Current average household sewer bill per year (2008 / 2011)
> 1 MGD (1 mg/l TP; 10 mg/l TN)	27,544	10,012	$45,594.00	$216.00
> 1 MGD (1 mg/l TP; 10 mg/l TN)	37,280	14,614	$47,065.00	$372.00
> 1 MGD (1 mg/l TP; 10 mg/l TN)	28,190	12,337	$52,317.00	$265.44
> 1 MGD (1 mg/l TP; 10 mg/l TN)	33,525	14,041	$40,055.00	$360.00
> 1 MGD (1 mg/l TP; 10 mg/l TN)	108,623	28,290	$40,130.00	$152.14
> 1 MGD (1 mg/l TP; 10 mg/l TN)	82,178	23,998	$40,434.00	$187.20
> 1 MGD (1 mg/l TP; 10 mg/l TN)	104,170	41,841	$45,004.00	$218.28

> 1 MGD (1 mg/l TP; 10 mg/l TN)	7414	2965.6	35,689	$600.00
> 1 MGD (1 mg/l TP; 10 mg/l TN)	9500	3800	37,554	$236.10
> 1 MGD (1 mg/l TP; 10 mg/l TN)	5,200	2080	25,161	$276.00
> 1 MGD (1 mg/l TP; 10 mg/l TN)	5,813	2,325	31,729	$387.60
				Facilities with
Yes	1,520	523	$50,729	$362.40
Yes- but Columbia Falls already meets it	4,688	1,621	$38,750	$532.20
	10,325.00	4130	$38,082	240.00
Yes.	820	399	35806.00	200
Yes	2,869	1,290	$29,000	$138.48

Yes	3,111	1,522	$40,320	$409.56
	4621.00	1848.40	37000.00	213.96
	9,756.00	3,902	$40,379	305.28

Current average sewer fee as % of MHI	Notes	Capital cost (million dollars) to meet the approximate variance levels (WERF)	Annual Capital cost to meet the approximate variance levels (L4 WERF)
> 1 MGD			
0.47%	Already meeting variance levels. Sewer rates obtained from City in 2011. Plant ~WERF Level 2.	$0.00	$0.00
0.79%	Already meeting variance levels. Sewer rates obtained from City in 2011. Plant ~WERF Level 2. Really Level 3 for TN and 1 for TP	$0.00	$0.00
0.51%	Sewer rates obtained from City in 2011. Plant ~ WERF Level 1.	$18.36	$1,472,472.00
0.90%	Will already meet variance levels after upgrade. While current monthly fee is $13.50, the $27 million upgrade in new capital costs plus $1.125 million in additional O&M costs which would bring them to 5 TN and 0.1 TP would raise rates to $30 per month	$27.00	$2,165,400.00
0.38%	Already meets variance levels	$0.00	$0.00
0.46%	and Great Falls (treatment levels, cost, etc.) were obtained from HDR.	$85.00	$6,817,000.00
0.49%	and Great Falls (treatment levels, cost, etc.) were obtained from HDR.	$85.00	$6,817,000.00

1.68%		17.00	1,363,400.00
0.63%		22.20	1,780,440.00
1.10%		5.00	793,980.00
1.22%		1.00	200,500.00
Facilities with < 1MGD			
0.71%	Mainly designed to remove ammonia and some TN, but now have NO3 limit. May be able to meet with operational changes. TP of 2 mg/l may require more capital & O&M expenses. Ref: planning document, SRF loan application	$7.56	$606,312.00
1.37%	Upgrade to an existing Chemical P-removal plant - actual effluent concentrations are 4 TN and 0.05TP--**already included in current fee**	$0.00	$0.00
0.63%	Sewer Fee and MHI based on DEQ estimates. DEQ MHI value less than the 2010 USDA county data.	$26.40	$2,117,280.00
Lagoons			
0.56%	lagoon to simple mechanical system - ref: Gary Swanson, consulting engineer- 15TN, 2TP	$0.68	$54,536.00
0.48%	4000 gallons. Base rate $9.48 at 3000 gallons plus $2.06 for next 1,000 gallons	$12.50	$1,018,540.00

1.02%		$15.25	$1,261,145.00
0.58%		$10.00	$802,000.00
	Sewer Fee and MHI based on DEQ estimates. DEQ MHI value less than the 2010 USDA county data.	$10.00	$802,000.00

Annual Operations costs to meet the approximate variance levels L4WERF	Annual Capital and Operations cost ($)	Annual Additional Cost per Household (increase in sewer rate)	Predicted average household sewer fee to meet criteria	Expected % MHI to Meet Variance Numbers (plus current wastewater fees)
0.00	$0.00	$0.00	$216	**0.47**
0.00	$0.00	$0.00	$372	**0.79**
109,500.00	$1,581,972.00	$128.23	$394	**0.75**
1,125,000.00	$3,290,400.00	$234.34	$594	**1.48**
$0.0	$0.00	$0.00	$152	**0.38**
$949,000.0	$7,766,000.00	$323.61	$511	**1.26**
$949,000.0	$7,766,000.00	$185.61	$404	**0.90**

$73,000.00	$1,436,400.00	$484.35	$1,084	**3.04**
$459,900.00	$2,240,340.00	$589.56	$826	**2.20**
$238,000.00	$1,031,980.00	$496.14	$772	**3.07**
$150,000.00	$350,500.00	$150.74	$538	**1.70**
100,000.00	$706,312.00	$1,350.50	$1,713	3.38
0.00	$0.00	$0.00	$532	1.37
643860	$2,761,140.00	$668.56	$909	2.39
7,300.00	$61,836.00	$154.98	$355	0.99
7,300.00	$1,025,840.00	$795.22	$934	3.22

602,000.00	$1,863,145.00	$1,224.14	$1,634	4.05
300,000.00	$1,102,000.00	$596.19	$810	2.19
300,000.00	$1,102,000.00	$282.39	$588	1.46

Percent increase in Wastewater bill	2% MHI	Total additional annual amount town would spend total to get to 2% MHI	
0%	$911.88	$6,967,150.56	$6,967,150.56
0%	$941.30	$8,319,750.20	$8,319,750.20
48%	$1,046.34	$9,633,963.30	$9,633,963.30
65%	$801.10	$6,193,485.10	$6,193,485.10
0%	$802.60	$18,401,513.40	$18,401,513.40
173%	$808.68	$14,914,277.04	$14,914,277.04
85%	$900.08	$28,527,193.80	$28,527,193.80

81%		
373%	$1,014.58	$341,090.14
0%	$775.00	$393,578.80
279%		
77%	$716.12	$205,931.88
574%	$580.00	$569,560.80

299%	$806.40	$603,990.48

WERF

Level	Description	Capital Cost ($/gpd)	Operations ($1,000/yr/10 MG Treated)
Level 1	No N and P removal	9.3	250
Level 2	1 mg/l TP; 8 mg/l TN	12.7	350
Level 3	0.1-0.3 mg/l TP; 4-8 mg/l TN	14.4	640
Level 4	<0.1 mg/l TP; 3 mg/l TN	15.3	880
Level 5	<0.01 mg/l TP; 1 mg/l TN	21.8	1370

Costs to Meet Criteria	Capital Cost($million/MGD)	Design Flow	Facility Upgrade Capital Costs ($million)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)
Kalispell	0	5.4	$0.00	$0.00
Bozeman	0	13.8	$0.00	$0.00
Helena	3.4	5.4	$18.36	$1.47
Butte	Actual Costs	1	$27.00	$2.17
Missoula				
Great Falls	3.4	25	$85.00	6.817
Billings	3.4	25	$85.00	$6.82
Livingston	3.4	5	$17.00	1.3634
Miles City	6	3.7	$22.20	1.78044
Hamilton	5	1.98	$9.90	0.79398
Lewistown	1	2.5	$2.50	0.2005
Manhattan				
Columbia Falls	Actual Costs	0.766	$3,927,688.00	$315,000.58
Havre	6	4.4	$26.40	2.11728
Philipsburg	3.4	0.2	$0.68	$0.05
Cut Bank				
Deer Lodge				
Glendive	10		$10.00	0.802
Red Lodge				

Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Operations ($1/ MG/day Treated)	Operations Costs ($/ year/ 1 MGD)	Actual Flow	Facility Upgrade Operations Costs ($/year/1 MGD) based on Facility MGD	Membrane Replacement Cost ($24,000 /yr/1 MGD)*Actual Flow - not necessary b/c no RO
$0.00	0	0.00	3.10	0.00	0.00
$0.00	0	0.00	5.80	0.00	0.00
$1,472,472.00	100	36,500.00	3.00	109,500.00	0.00
$2,165,400.00	0	0.00	4.00	1,125,000.00	0.00
$6,817,000.00	100	36,500.00	26	949,000.00	0.00
$6,817,000.00	100	36,500.00	26.00	949,000.00	0.00
$1,363,400.00	100	36,500.00	2.00	73,000.00	0.00
$1,780,440.00	630	229,950.00	2	459,900.00	0.00
$793,980.00		350,000	0.68	238,000.00	
$200,500.00		100,000.00	1.5	150,000.00	
$315,000.58	0	0.00	0.37	0.00	0.00
$2,117,280.00	630	229,950.00	2.8	643,860.00	0.00
$54,536.00	100	36,500.00	0.20	7,300.00	0.00
$802,000.00		300,000		300,000	

Total Operations costs including membrane replacement
0.00
0.00
109,500.00
1,125,000.00
$949,000.00
949,000.00
$73,000.00
$459,900.00
238,000.00
150,000.00

$0.00
$643,860.00
7,300.00

300,000

Community	Median Household Income (2010) - countywide MHI. Recommend updating for service area.	Population	Number of Households (Population / 2.5) based on 2000 Census	Current Average Annual Household Wastewater Bill	Design Flow (MGD)	Actual Flow (MGD)	Current wastewater MHI	Percent MHI needed to get to RO/Base Numeric Nutrient Criteria (including current fees)
Kalispell	$39,953.00	27,544	10,012	$216.00	5.4	3.10	0.54%	1.83%
Bozeman	$41,661.00	37,280	14,614	$372.00	13.8	5.80	0.89%	2.92%
Helena	$47,152.00	28,190	12,337	$265.44	5.4	3.00	0.56%	1.72%
Butte	$37,335.00	33,525	14,041	$360.00	8.5	4.00	0.96%	2.15%
Billings	$45,004.00	104,170	41,841	$218.28	25	26	0.49%	2.41%
Missoula	$34,319.00	66,788	27,553	$152.14			0.44%	1.47%
Great Falls	$40,718.00	58,505	23,998	$187.20	25	26	0.46%	4.18%
Livingston	$35,689.00	7,414	2,966	$600.00			1.68%	7.23%
Miles City	$37,554.00	9,500	3,800	$236.10			0.63%	3.83%
Hamilton	$25,161.00	5,200	2,080	$276.00			1.10%	5.47%
Lewistown	$31,729.00	5,813	2,325	$387.60			1.22%	3.81%
Havre	$43,577.00	10,325	4,130	$240.00	4.4		0.55%	3.68%
Columbia Falls	$38,750.00	4,688	1,621	$532.20	0.766	0.37	1.37%	3.02%
Manhattan	$50,729.00	1,400	560	$362.40	0.6		0.71%	2.48%
Philipsburg	$31,375.00	820	399	$200.00	0.2	0.2	0.64%	11.70%
Cut Bank	$44,833.00	2,869	1,290	$138.48			0.31%	2.65%
Deer Lodge	$40,320.00	3,111	1,522	$409.56			1.02%	3.07%
Glendive	$42,821.00	4935	1,883	$213.96			0.50%	3.32%
Redlodge	$50,123.00	2125	1,055	$305.28			0.61%	5.16%
Big Fork	$44,398.00	4270	1,708	$580.36			1.31%	2.46%
Highwood	$62,614.00	176	53	$600.00			0.96%	2.54%
Circle	$29,000.00	615	234	$259.56			0.90%	5.47%

Yellow fill = Greater than 2% MHI to reach to certain level of wastewater treatment

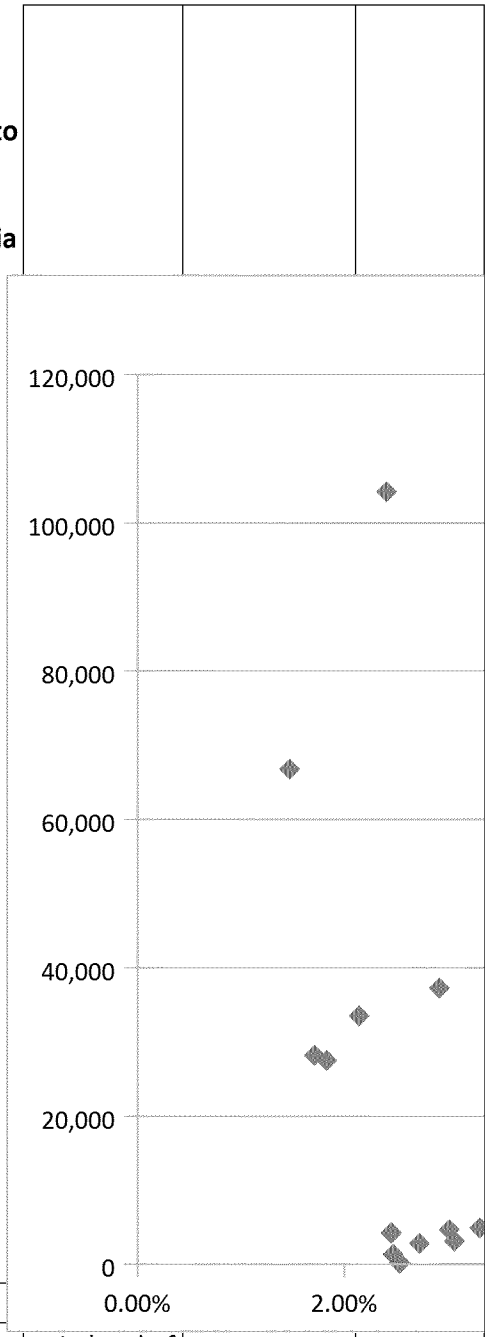
Orange fill = Greater than 100% increase in wastewater fee costs to reach to certain level of w

Blue Fill = Town already meets the standard so no new costs or treatment needed

Increase over current Wastewater Bill to Reach RO	Percent MHI needed to get to Variance in SB367 (including current fees)	Increase over current Wastewater Bill to Reach Variance	2% MHI per household	Total additional annual amount Town Would Need to Spend to get to 2% MHI
239%	0.47%	0%	$799	$5,837,597
228%	0.79%	0%	$833	$6,740,269
205%	0.75%	48%	$943	$8,359,551
123%	1.48%	65%	$747	$5,429,655
398%	0.90%	85%	$900	$28,527,194
232%	N/A	N/A	$686	$14,719,915
808%	1.26%	173%	$814	$15,050,586
120%	1.37%	0%	$775	$393,579
	3.38%	373%	$1,015	$365,221
#REF!	0.99%	77%	$628	$170,573
	3.22%	574%	$897	$978,052
	4.05%	299%	$806	$603,990

astewater treatment

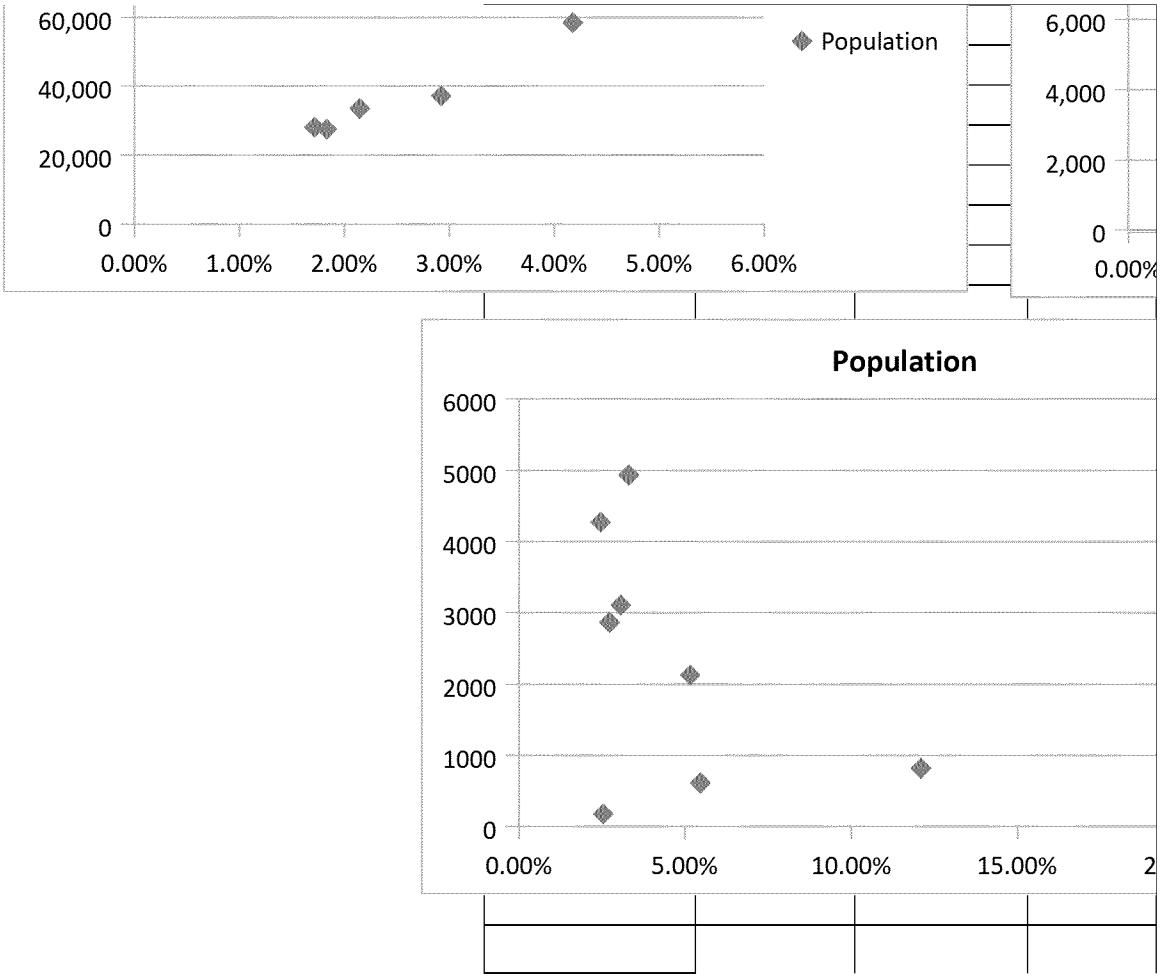
Community	Median Household Income (2010) - countywide MHI. Recommend updating for service area.	Population	Percent MHI needed to get to RO/Base Numeric Nutrient Criteria (including current fees)
Billings	$41,841.00	104,170	2.41%
Missoula	$27,553.00	66,788	1.47%
Great Falls	$23,998.00	58,505	4.18%
Bozeman	$14,614.00	37,280	2.92%
Butte	$14,041.00	33,525	2.15%
Helena	$12,337.00	28,190	1.72%
Kalispell	$10,012.00	27,544	1.83%
Havre	$4,130.00	10,325	3.68%
Miles City	$3,800.00	9,500	3.83%
Livingston	$2,965.60	7,414	7.23%
Lewistown	$2,325.20	5,813	3.81%
Hamilton	$2,080.00	5,200	5.47%
Columbia Falls	$1,621.00	4,688	3.02%
Manhattan	$560.00	1,400	**2.48%**
Glendive	$1,883.00	4935	3.32%
Big Fork	$1,708.00	4270	2.46%
Deer Lodge	$1,522.00	3,111	3.07%
Cut Bank	$1,290.00	2,869	2.73%
Redlodge	$1,055.00	2125	5.16%
Philipsburg	$399.00	820	12.10%
Circle	$234.00	615	5.47%
Highwood	$53.00	176	2.54%



Yellow fill = Greater than 2% MHI to reach to certain level of wastewater treatment

Orange fill = Greater than 100% increase in wastewater fee costs to reach to certain level of waste

Blue Fill = Town already meets the standard so no new costs or treatment needed


60,000
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1.00%
2.00%
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Population
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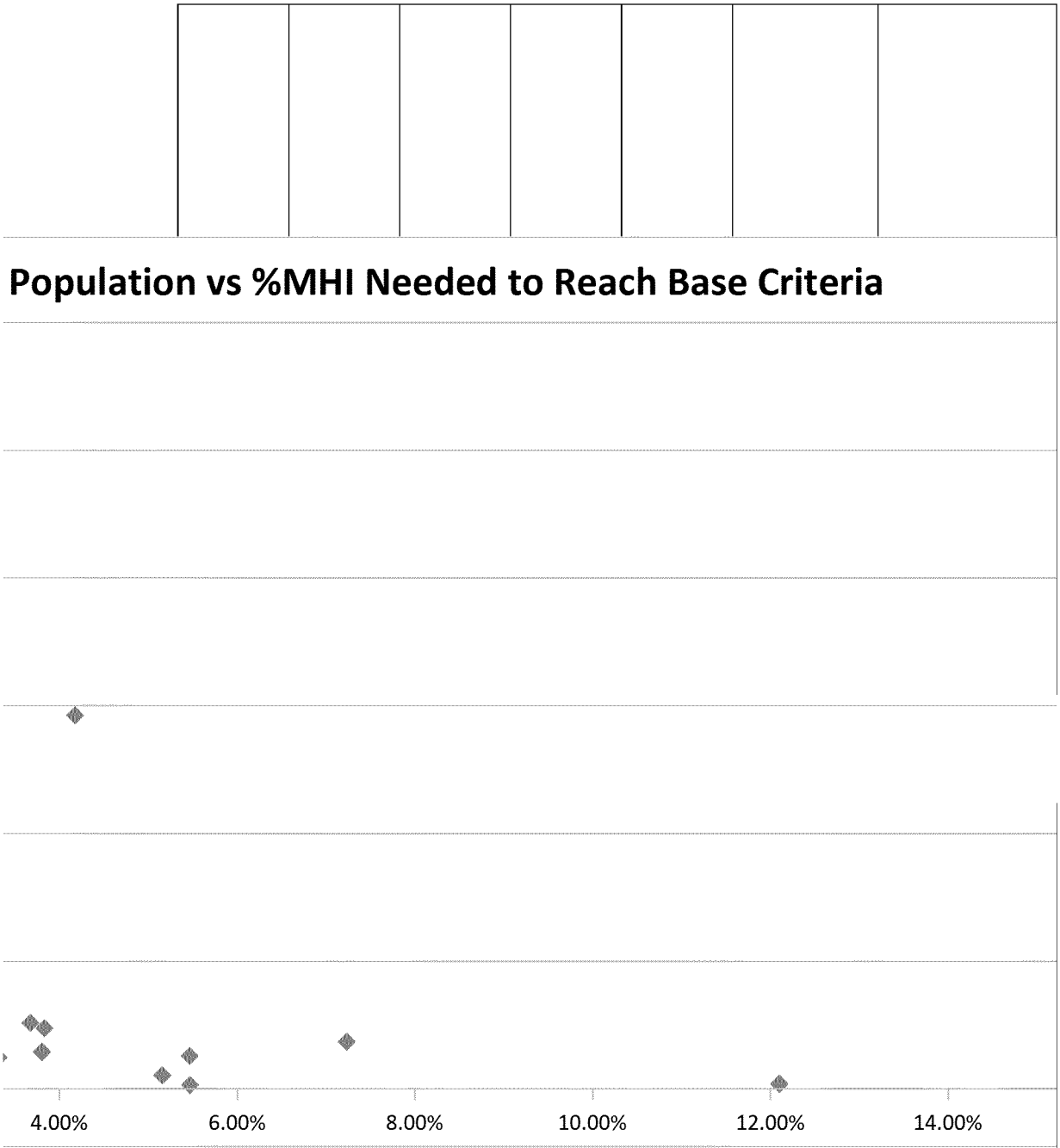
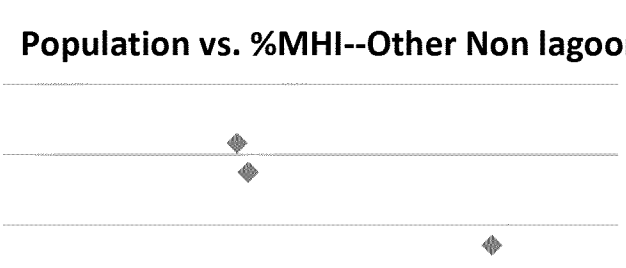
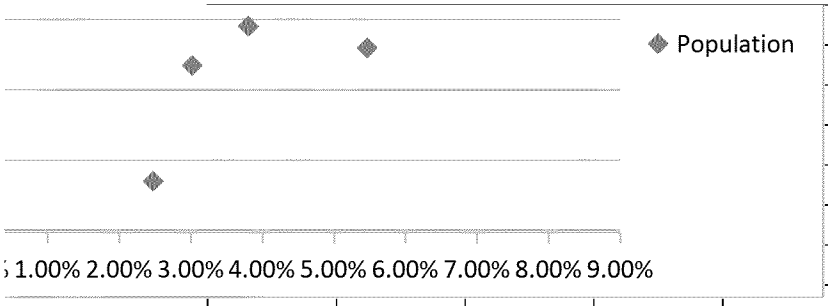
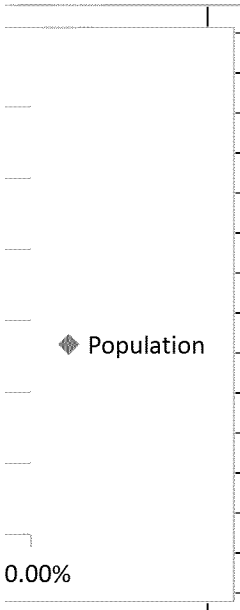
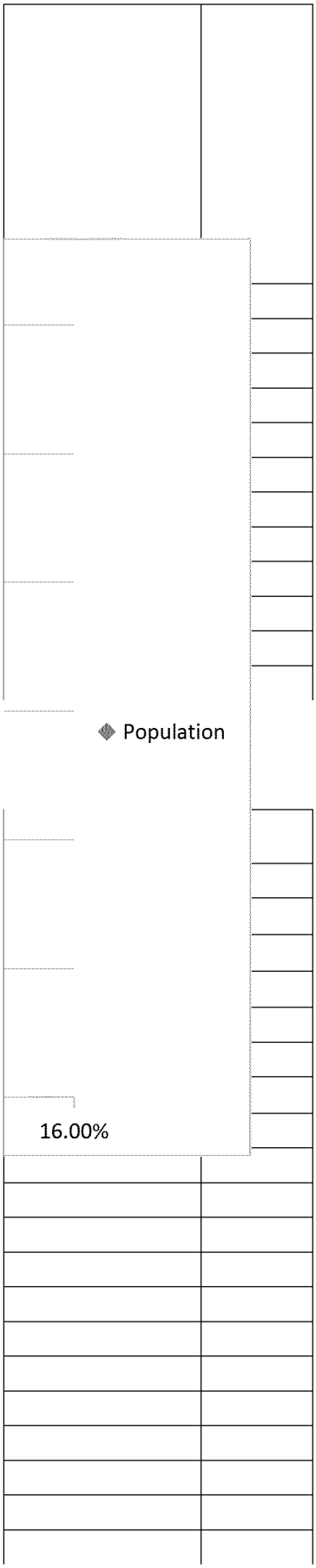

Population vs %MHI Needed to Reach Base Criteria
4.00%
6.00%
8.00%
10.00%
12.00%
14.00%
water treatment


Population vs. %MHI--Other Non lagoons


Population
1.00% 2.00% 3.00% 4.00% 5.00% 6.00% 7.00% 8.00% 9.00%


Population
0.00%


Population
16.00%
